NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

THE EARNINGS OF VETERANS: EFFECTS OF MILITARY SERVICE

by

Russell J. Sansone
March 2015

Thesis Advisor: Marigee Bacolod
Co-Advisor: Simona L. Tick

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704–0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	March 2015	Master's Thesis

4. TITLE AND SUBTITLE
THE EARNINGS OF VETERANS: EFFECTS OF MILITARY SERVICE

5. FUNDING NUMBERS

6. AUTHOR(S) Russell J. Sansone

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)
N/A

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number ____N/A____.

12a. DISTRIBUTION / AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited	A

13. ABSTRACT (maximum 200 words)

This thesis examines the effects of military service on veterans' earnings in the civilian labor force. This is important as the services allocate large amounts of resources to not only ensure readiness for the next mission, but to understand its return on investment and how to recruit and retain the force.

Using data from Integrated Public Use Microdata Series 2000–2012 and multivariate analysis, this thesis identifies premiums and penalties in the civilian labor market associated with active service during conscription and the All-Volunteer Force. The analysis controls for educational attainment, occupation, race, periods of service, and active service years, and finds a penalty for veterans who have a post high school education, who, on average, have earnings that are lower than their observationally similar non-veteran counterparts. In addition, veterans in business and finance are observed to have a penalty for military service, compared to veterans in other occupations who are observed to earn more than non-veteran counterparts. Overall, this thesis finds a premium associated with service, as measured by post-service civilian earnings. The benefit of service varies across occupations, educational attainment and other factors.

14. SUBJECT TERMS	15. NUMBER OF PAGES
veteran earnings, veteran wages, veteran data, veteran regression model	71
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UU

NSN 7540–01-280-5500

Standard Form 298 (Rev. 2–89)
Prescribed by ANSI Std. 239–18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

THE EARNINGS OF VETERANS: EFFECTS OF MILITARY SERVICE

Russell J. Sansone
Lieutenant Commander, United States Navy
MPA, Troy State University, 2005

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
March 2015

Author: Russell J. Sansone

Approved by: Marigee Bacolod
Thesis Advisor

Simona L. Tick
Co-Advisor

William R. Gates
Dean, Graduate School of Business & Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

This thesis examines the effects of military service on veterans' earnings in the civilian labor force. This is important as the services allocate large amounts of resources to not only ensure readiness for the next mission, but to understand its return on investment and how to recruit and retain the force.

Using data from Integrated Public Use Microdata Series 2000–2012 and multivariate analysis, this thesis identifies premiums and penalties in the civilian labor market associated with active service during conscription and the All-Volunteer Force. The analysis controls for educational attainment, occupation, race, periods of service, and active service years, and finds a penalty for veterans who have a post high school education, who, on average, have earnings that are lower than their observationally similar non-veteran counterparts. In addition, veterans in business and finance are observed to have a penalty for military service, compared to veterans in other occupations who are observed to earn more than non-veteran counterparts. Overall, this thesis finds a premium associated with service, as measured by post-service civilian earnings. The benefit of service varies across occupations, educational attainment and other factors.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

AFQT	Armed Forces Qualification Test
AVF	All Volunteer Force
BAH	basic allowance for housing
BAS	basic allowance for subsistence
CPS	Current Population Survey
DMDC	Defense Manpower Data Center
GED	General Education Diploma
IPUMS	Integrated Public Use Microdata Series
MCGD	Matched Comparison Group Design
MEF	Master Earnings File
MEPCOM	Military Entrance Processing Command
MOS	military occupational specialty
NLSY	National Longitudinal Survey of Youth
RCS	Reserve Component Surveys
ROI	return on investment
SRB	Selective Reenlistment Bonus
STATA	Statistics Data/Analysis
SSA	Social Security Administration
TFDW	Total Force Data Warehouse
YOS	years of service

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

To Professor Bacolod and Professor Tick: I am extremely grateful for you taking me under your wings and providing outstanding professional expertise and guidance in accomplishing great things. I couldn't have completed this thesis without you.

To my beautiful bride, Miguela: Thank you for all of your love and the many sacrifices you make in support of our career, degree, and thesis completion.

To my sons Yuije and Alex, my daughter-in-law Nikita, and my granddaughter Sophia: You motivate me to do well every day, while bringing so much joy into my life.

To my mom: You continually support me and always taught me the importance of a good education.

To my dad: I know is watching from above, always teaching me that I can accomplish anything as long as I keep focus and put my mind to it.

To my brother Rick: Thank you for inspiring me on a daily basis and putting a smile on my face when I need it the most.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

The United States military services utilize a vast network of resources in order to man, train, and equip the force. The return on investment (ROI) for the military is an important estimate of the return for the amount it allocates to train individual service members in the performance of their duties. This training and occupational experience offers benefits for both the military and individual service member not only while on active service but, potentially, post-separation in the civilian labor force. Measurement of this proposed benefit is no simple task, as researchers continue to develop models and analyze criteria to assess the true benefit or disadvantage that active military service has on veterans' transitions into the civilian labor force.

B. PURPOSE AND BENEFITS

This research examines veterans who have served in the armed forces and determines how this military service affects wage earnings in the civilian labor force. It also provides a comprehensive analysis of service comparison during the conscription period and today's All Volunteer Force (AVF).

The answers to the following primary and secondary research questions address the effects of military service and how they relate to earning potential in the civilian labor force after completion of active service:

1. Does prior military service have an effect on earnings potential in the civilian labor force?
2. Do veterans earn more after service completion than observationally similar non-veterans?

This research also provides a more extensive analysis of veterans' income using a more robust data set than previous studies. The robustness of this data set includes more than 19 million observations, of which more than 1.6 million are veterans (exceeding other research data sets by 90%). It also offers a framework for service members who are deciding whether to remain on active duty or to begin "second careers" in the civilian

sector. Furthermore, this research can assist potential recruits in making informed decisions on whether to serve.

C. THESIS ORGANIZATION

This thesis comprises six chapters. Chapter II reviews current literature on the effects of enlisted military service and civilian labor force earnings. Chapter III identifies data source, descriptive statistics, and data description used for analysis. Chapter IV describes the models used for multivariate statistical analysis. Chapter V presents and discusses the results of the multiple regression models that examine the relation between military service and civilian labor market earnings. Chapter VI presents conclusions and recommendations.

II. LITERATURE REVIEW

A. OVERVIEW

This chapter reviews current literature on the effects of enlisted military service on civilian labor force earnings. Research in the field of veterans' earnings is fairly robust; different methods and different data sources are used in determining outcomes, as this literature review demonstrates. In addition, the use of different military service sample selections and inclusions to wage income may have an impact on findings.

B. RESEARCH MODELS

1. Loughran, Martorell, Miller, and Klerman (2011)

In 2011, Loughran, Martorell, Miller, & Klerman studied whether enlistees ultimately have higher labor market earnings than they otherwise would have if they decided not to enlist in the military service. The empirical strategy of this article begins with the use of data from the Military Entrance Processing Command (MEPCOM) and represents individuals who applied for military service between 1989 and 2003. Earnings data are retrieved from the Social Security Administration's (SSA) Master Earnings File (MEF) and the Defense Manpower Data Center (DMDC) (Loughran et al., 2011). In essence, this research is an extension of the empirical model first introduced by Angrist (1998) that refines comparisons of enlistees and those who are qualified to enlist but chose not to volunteer for military service (Loughran et al., 2011).

The actual empirical approach is multivariate with the use of panel data and education, sex, Armed Forces Qualification Test (AFQT) category, race, service, and age used as independent variables. Then, the differences in mean earnings are calculated. The main finding of this article identifies an 11% premium in income for Army enlistees compared to non-enlistees over the long-run (Loughran et al., 2011). Furthermore, additional results include that the estimated effect of enlistment on earnings is 22% for blacks, 11% for Hispanics, and 5% for whites (Loughran et al., 2011).

As previously mentioned, "a long line of empirical research has sought to determine whether enlistment during the All-Volunteer era (1973 and later) has a causal impact on labor market earnings" (Loughran et al., 2011, p. 2). Loughran et al. (2011) identify that prior research indicates a comparison of enlistees and non-enlistees via data collected from surveys and compares their labor market earnings, controlling for common demographics. The latter's findings are that enlistees earn more than non-enlistees, as identified from the research of Bryant, Samaranayake, and Wilhite (1993); Magnum and Ball (1989); Phillips et al. (1992); Andrisani and Daymont (1989); and Stafford (1991) (Loughran et al., 2011).

This research claims that the Angrist (1998) empirical model uses a more comprehensive population set that provides a better estimate of the effect of enlisting on labor market earnings. This is because the comparison is able to control for similar characteristics of qualified individuals who enlist and those who do not enlist. In addition, the main differences of this study from previous studies are that this research uses a more recent sample set and panel data that provides results for enlistees up to 18 years following the application process, accounts for additional monetary allowances such as housing allowance and bonuses that are a substantial portion of military income, composes a more significant range of differences between applicants, and shows how enlistment affects not only earnings but also attainment of a college education (Loughran et al., 2011).

This research expands our knowledge of how enlistment affects labor market incomes when comparing enlistees and non-enlistees, as in studies prior to Angrist (1998) and also the Angrist (1998) model that compares qualified candidates who enlist and those who do not enlist. This research also identifies limitations and how over the years the models may have changed; as they are echoing the same findings with dated data sets. Lastly, this article identifies opportunities for the completion of additional research.

2. Martorell, Miller, Daugherty, and Borgschulte (2013)

The research of Martorell, Miller, Daugherty, and Borgschulte (2013) expands on the study conducted by Loughran et al. (2011) above by seeking answers to the effects of

military service on the civilian labor market and how they differ when determining years of service (YOS) and military occupational specialty (MOS). This research uses the same empirical model as Loughran et al. (2011) but goes a step further; evaluation takes place for YOS and also MOS (Martorell, Miller, Daugherty, & Borgschulte, 2013). Overall findings of enlistment on earnings mimic those of Loughran et al. (2011), creating short-run premiums of 3–4% and a long-run effect of 8%, creating a positive return on earnings. When examining YOS, two years of service is associated with a negative return on military service; there may be other mitigating factors that cause a selection bias, as this is not the completion of a typical enlistment contract (Martorell et al., 2013). Other YOS variables indicate a positive trend on earnings that exceeds 20% at YOS 4–12, and more than doubles at YOS 16 for individuals who do not separate when compared to non-veterans' earnings (Martorell et al., 2013). This study identifies large long-run earnings gains for all occupational categories, especially healthcare showing 35% gains for veterans when compared to their non-veteran counterparts (Martorell et al., 2013).

Previous research identifies that controlling for years of service and military occupational specialty was not a widely used practice and therefore was required to provide a better understanding of veterans' earnings when compared to non-veterans. YOS and MOS are not the only differences: "this research examines how economic conditions in the civilian labor market that exist at the time individuals exit active duty affect postservice earnings" (Martorell et al., 2013, p. xi). Furthermore, they examine the impact of participation in a military-to-civilian transition program. Economic conditions upon separation and the transition program evaluation are beyond the scope of this thesis and will not be evaluated.

This paper provides a more in-depth examination of YOS and MOS that is similar to this thesis research, as this can provide further comparison of findings between research papers. Although the independent variables mirror the work of Loughran et al. (2011), they also provide validation that the findings of Martorell et al. (2013) are on track and establish justification of previous work.

3. Davila and Mora (2012)

Davila and Mora (2012) research the impact of the catastrophic events of 9/11 upon earnings of veteran men when compared to the civilian labor market. This study also includes the examination of racial groups to determine if the effects on earnings also relate to specific race(s). The empirical strategy of this research uses data from the 2000 decennial census and IPUMS data from 2001–2008. The model is the Oaxaca-type wage decomposition method that analyzes the changes in wages of veterans and non-veterans before the events of 9/11 and compares this with wages post 9/11 (Davila & Mora, 2012). "They first estimate an earnings function solely for nonveterans in each year to obtain their structure of wages" (Davila & Mora, 2012, p. 262). "Then, after regression estimation, the difference is calculated between actual earnings and predicted earnings, which results in the impact of veterans' earnings on the civilian labor market" (Davila & Mora, 2012, p. 262). The main findings indicate that pre 9/11 veterans during this time period had an average hourly income of 5.1% less than non-veterans; post 9/11 results indicate that this penalty slightly decreased to 3.5%, indicating an improvement to veteran's earnings (Davila & Mora, 2012). This research also indicates that race separation provides unbalanced results, as earnings for Hispanics and non-Hispanic whites increased post 9/11 while those for other race categories did not (Davila & Mora, 2012).

This research is the first of its kind when investigating the effects of 9/11 on U.S. veteran males. Other research does not hone in on the specifics of 9/11 when comparing U.S. veterans to earnings in the civilian labor market. Note that data from 2001 and later is included in other research as in this thesis. This thesis does not interpret results solely based on the events of 9/11. Additional research also provides the effects of 9/11 for Arab-Americans and individuals of similar ethnic backgrounds as identified in the studies of Davila and Mora (2005) and Kaushal, Kaestner, and Reimers (2007), resulting in negative civilian labor market outcomes (Davila & Mora, 2012).

This paper does not claim to be the first to examine earnings results of 9/11 on U.S. veterans. The variable set is different and uses additions to the "standard" set of

variables, including having a disability, being an immigrant, immigrant's tenure living in the United States, and geographic region (Davila & Mora, 2012).

Examining the results of 9/11 on veteran labor market outcomes continues to be a robust research opportunity. Interestingly enough, this study expands our knowledge by providing overall negative results in the short-run for veterans' earnings when compared to non-veterans in the civilian labor market. Previous literature generally indicates a premium that results because of military service. This research also identifies that differentiation between data sets and also variable selection produce different results for similar topics of study.

4. Hirsch and Mehay (2003)

Hirsch and Mehay (2003) seek to determine the effect of military service on earnings in the civilian labor market. The empirical strategy uses the Matched Comparison Group Design (MCGD) with data from Reserve Component Surveys (RCS) from 1986 and 1992 that estimates the effect of earnings between active duty reservists and reservists without active duty service. "The first method of comparison we employ is the use of an age-adjusted mean wage differential, based on mean differences within age groups. This effectively matches veterans to all nonveterans of the same age" (Hirsch & Mehay, 2003, p. 681). Then, the authors use a logit model that predicts the selection sample are likely veterans serving on active duty using age and race variables, a methodology called propensity score matching (Hirsch & Mehay, 2003). The findings of this research conclude that enlisted reservists serving on active duty statistically earn 3% more than non-active duty reservists, officer reservists serving on active duty earn 10% more than their counterparts, returns for white reservists on active duty show a small penalty, blacks on average enjoy a 5% premium, and Vietnam Veterans earn 1.5% less than non-active duty reservists (Hirsch & Mehay, 2003).

Prior research (as previously identified in this literature review) is the foundation of investigating veterans' earnings and the associated effects on the civilian labor force. Each research effort tends to identify incremental changes to models and variable selection. The research of Hirsch and Mehay (2003) continues these incremental changes

by using alternative sources of information, such as the RCS versus census, Current Population Survey (CPS), and National Longitudinal Survey of Youth (NLSY). In addition, this research also differentiates by using a different model, MCDG.

This research discusses the importance of occupations and how they relate to economic theory; this results in identifying the need to control for MOS in follow-on studies (Hirsch & Mehay, 2003). In addition, the data set provides the opportunity to differentiate between officers and enlisted and, in turn, measure their effects in the civilian labor market although the results for this study are conservative, future research validates its findings; even though it does not, always adhere to the advice it provides in measuring veterans' effects on the civilian labor market.

C. SUMMARY

Martorell et al. (2013) and Loughran et al. (2011) use Angrist's (1998) research model as the foundation for studies of veterans' earnings and the effects on the civilian labor market. This foundation anchors itself on eligible military applicants and provides empirical analysis between those who enlist and those who do not enlist from sample data sets for years 1985–2010 and 1989–2003, respectively. Comparatively, the results of these studies are very similar and determine that enlisting in the military service is beneficial, with the exception of individuals who complete fewer than two years of service as found in Martorell et al. (2013), which translates to the possibility of sample selection bias for these veterans.

Davila and Mora (2012) focus on the events of 9/11 and compare veterans' pre 9/11 earnings to post 9/11 earnings in the United States from 2001–2008 IPUMS census data. The Oaxaca-type wage decomposition model differs from previous regression models of this literature review and identifies different results that equate to a penalty for service pre 9/11. In addition, post 9/11 wages do increase by 5.5% for Hispanics, which is the most substantial increase of veterans' earnings in this sample set.

Hirsch and Mehay (2003) use yet a different model and data set in determining the impact of veterans' earnings in the civilian labor market. By using RCS from 1986 and 1992, they are able to differentiate between officer and enlisted personnel along with

comparing active duty reservists and reservists without active duty. This data selection shows differences from the Angrist (1998) model; they identify similar results, suggesting validation of these studies. Lastly, Martorell et al. (2013) and this research apply occupation as an independent variable that corresponds with economic theory that further validates the findings of this research.

The economic analysis of this thesis will expand our knowledge of veterans' earnings in the civilian labor force by clearly applying a logical multivariate approach. The data set for this research is the most robust of these studies, with more than 19 million observations, including more than 1.6 million veterans. In addition, this research possesses the most up-to-date data available from the Integrated Public Use Microdata Series (IPUMS) database that includes surveys from the 2000–2012 U.S. Census. Furthermore, this thesis goes beyond the "standard" set of independent variables and also controls for regions of the U.S., marital status, education level, occupation, and whether a citizen is born in the U.S. or naturalized, thus eliminating the possibility of omitted variable bias. Lastly, the use of interaction terms provides additional accuracy in the estimates of this research.

The main difference of this thesis begins with the analysis of veterans' earnings in the civilian labor force. This research identifies actual veterans having served in the military during specific periods during conscription and the AVF. This research does not estimate veterans based upon the Angrist (1998) model and, therefore, alleviates bias of individuals who did not serve. In addition, the dependent variable log income wage only represents income that veterans earn in the civilian labor market; it does not include the basic allowance for housing (BAH), basic allowance for subsistence (BAS), income from disabilities, or selective reenlistment bonuses (SRB) that research in the literature review identifies as additions to income. Also, this research does not focus only on enlisted personnel; the vetstaty variable encompasses all individuals having served in the military, creating more accurate findings.

Furthermore, this study does not ignore attainment of higher education; the majority of the literature review focuses on enlisted personnel with a high school

education. In addition, examination of five occupations is in concurrence with recommendations from Hirsch and Mehay (2003), as only two articles in the literature review account for basic economic theory concerning personal selection of occupations. This thesis only accounts for veterans serving two years or more and does not examine the outcomes of veterans serving fewer than two years, thus eliminating selection bias for those who do not complete military service requirements as identified in Martorell et al. (2013). Lastly, this study will sort specific periods of service for veterans during conscription and the AVF. This provides a comprehensive listing of both periods of military service in one thesis.

III. DATA DESCRIPTION

A. INTRODUCTION

This chapter identifies data source, descriptive statistics, and data description used for this research's multivariate analysis.

B. DATA SOURCE

The data source for this research is the Integrated Public Use Microdata Series (IPUMS) database. This thesis uses a robust data set that contains more than 19 million observations, of which more than 1.6 million are veterans observed from the 2000–2012 United States Census. The criteria for data selection are 18–65 year olds who served in the U.S. Armed Forces.

C. DESCRIPTIVE STATISTICS

Table 1 provides summary statistics for data set used in this thesis. Table 1 shows that the average wage income (incwage) in the data set is $38,631.51. The average age of the individuals captured in the data set is 40.5 years old. Veterans (vetstaty) represent approximately 9% of the data set.

Table 1. Data Set Descriptive Statistics
(after Integrated Public Use Microdata Series [IPUMS], 2000–2012)

Dependent Variable	Obs	Mean	Std. Dev.	Min	Max
incwage	19393897	38631.51	44812.60	4	666000
logincwage	19393897	10.0593	1.1519	1.3863	13.4091
Independent Variables					
Region/Age/Sex/Marital Status					
newenglandregion	19393897	0.0526	0.2232	0	1
newyorknewregion	19393897	0.0928	0.2901	0	1
midatlantiregion	19393897	0.1025	0.3033	0	1
southeastregion	19393897	0.1879	0.3906	0	1
midwestregion	19393897	0.2044	0.4032	0	1
southwestregion	19393897	0.1123	0.3158	0	1
mountainplainsregion	19393897	0.0618	0.2408	0	1
westernregion	19393897	0.1858	0.3889	0	1
age	19393897	40.4949	12.5434	18	65
agesquared	19393897	1797.1770	1027.0240	324	4225
male	19393897	0.5131	0.4998	0	1
female	19393897	0.4869	0.4998	0	1
married	19393897	0.6121	0.4873	0	1
notmarried	19393897	0.3879	0.4873	0	1
Race/Citizenship/Education					
white	19393897	0.7925	0.4055	0	1
black	19393897	0.0942	0.2921	0	1
hispanic	19393897	0.1131	0.3168	0	1
UScitizen	19393897	0.8709	0.3353	0	1
Uscitizennaturalized	19393897	0.0593	0.2362	0	1
nonUScitizen	19393897	0.0698	0.2548	0	1
nohighschooldiploma	19393897	0.1074	0.3096	0	1
highschooldiplomaorGED	19393897	0.2732	0.4456	0	1
somecollegnodegree	19393897	0.2402	0.4272	0	1
bachelorsassociatesdegree	19393897	0.2736	0.4458	0	1
mastersdegreeorabove	19393897	0.1057	0.3074	0	1
Occupation/Years of Service					
managementoccupations	19393897	0.0883	0.2837	0	1
busnsandfinancialoperationsocc	19393897	0.0407	0.1977	0	1
healthcarepractandtechocc	19393897	0.0488	0.2154	0	1
salesandrelatedocc	19393897	0.1058	0.3076	0	1
protectiveserviceocc	19393897	0.0214	0.1446	0	1
vetyrsmore	12685688	0.0857	0.2799	0	1
Veteran Status/Period of Service					
vetstaty	19393897	0.0873	0.2823	0	1
vet01ltry	11909939	0.0162	0.1263	0	1
vet95x00y	7483958	0.0142	0.1182	0	1
vet90x95y	7483958	0.0191	0.1367	0	1
vet80x90y	19393897	0.0257	0.1583	0	1
vet75x80y	19393897	0.0160	0.1256	0	1
vetvietny	19393897	0.0400	0.1959	0	1
vet55x64y	19393897	0.0086	0.0925	0	1
vetkoreay	19393897	0.0009	0.0300	0	1
vetwwiiy	19393897	0.000005	0.0023	0	1

Table 1. Data Set Descriptive Statistics (continued, [after IPUMS, 2000–2012])

Interaction Terms					
Veteran Status/Education					
vetstatynohsdiploma	19393897	0.0042	0.0646	0	1
vetstatyhsdipGED	19393897	0.0259	0.1589	0	1
vetstatysomecollege	19393897	0.0261	0.1595	0	1
vetstatyassoctebacc	19393897	0.0228	0.1492	0	1
vetstatymstrdoc	19393897	0.0084	0.0910	0	1
Veteran Status/Occupation					
vetstatymgmtocc	19393897	0.0090	0.0943	0	1
vetstatybusfinops	19393897	0.0034	0.0584	0	1
vetstatyhlthcare	19393897	0.0029	0.0540	0	1
vetstatysales	19393897	0.0074	0.0858	0	1
vetstatyprotectsrv	19393897	0.0049	0.0701	0	1
Veteran Status/Race					
vetstatywhite	19393897	0.0734	0.2607	0	1
vetstatyblack	19393897	0.0090	0.0944	0	1
vetstatyhispanic	19393897	0.0047	0.0684	0	1
Veteran Status/Years of Service					
vetstatyvetyrsmore	12685688	0.0808	0.2726	0	1
vet01ltryvetyrsmore	5201730	0.0119	0.1085	0	1
vet95x00yvetyrsmore	7483958	0.0087	0.0931	0	1
vet90x95yvetyrsmore	7483958	0.0156	0.1239	0	1
vet80x90yvetyrsmore	12685688	0.0244	0.1542	0	1
vet75x80yvetyrsmore	12685688	0.0155	0.1236	0	1
vetvietnyvetyrsmore	12685688	0.0396	0.1951	0	1
vet55x64yvetyrsmore	12685688	0.0107	0.1031	0	1
vetkoreayvetyrsmore	12685688	0.0012	0.0353	0	1
vetwwiiyvetyrsmore	12685688	0.0000	0.0026	0	1
Veteran Status/Period of Service					
vetstatyvet01ltry	11909939	0.0109	0.1038	0	1
vetstatyvet95x00y	7483958	0.0087	0.0931	0	1
vetstatyvet90x95y	7483958	0.0156	0.1239	0	1
vetstatyvet80x90y	19393897	0.0241	0.1533	0	1
vetstatyvet75x80y	19393897	0.0257	0.1583	0	1
vetstatyvetvietny	19393897	0.0398	0.1956	0	1
vetstatyvet55x64y	19393897	0.0086	0.0925	0	1
vetstatyvetkoreay	19393897	0.0009	0.0300	0	1
vetstatyvetwwiiy	19393897	0.000005	0.0023	0	1

D. VARIABLE DESCRIPTION

The variable descriptions below are from the IPUMS census information database. The variables are separated by the dependent variable and independent variables as described below.

1. Dependent Variable

The variable incwage is described as the amount of annual income an individual earns from employment. The variable is logged in order to interpret findings as a percentage. This variable is the outcome (dependent) variable, analyzed in the multivariate analysis chapter.

2. Independent Variables

The independent variables are categorized by standard demographics such as age, sex, and marital status. Factors that can explain differences in wage income are discussed below.

a. Regions

Earned income can differ by geographical region. The region categories are identified per the Bureau of Labor and Statistics website. These dummy variables include newenglandregion, newyorknewjerseyregion, midatlanticregion, southeastregion, midwestregion, southwestregion, mountainplainsregion, and westernregion. The largest sample population percentage is from the Midwest Region and the lowest is from the New England Region, as shown in Figure 1.

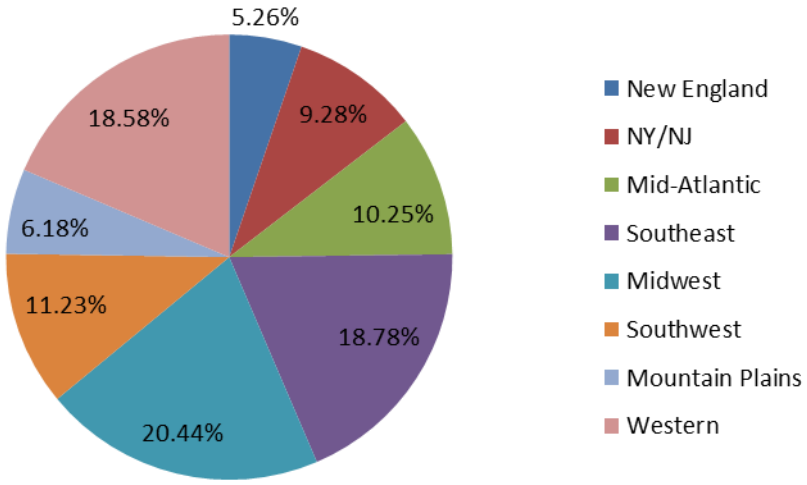

Figure 1. Population Distribution (after IPUMS, 2000–2012)

b. Age

Earnings from wages are known to vary by age, in a non-linear pattern (Borjas, 2010). The sample set includes individuals between the ages of 18–65. It also includes the variable age squared to identify the non-linear effect of age on wages over time.

c. Sex (Male)

Wages vary by gender. Therefore, a male binary variable is defined, where male equals "1" for a male, and "0" otherwise. Figure 2 provides a breakdown of the percentage of males and females that the sample set represents.

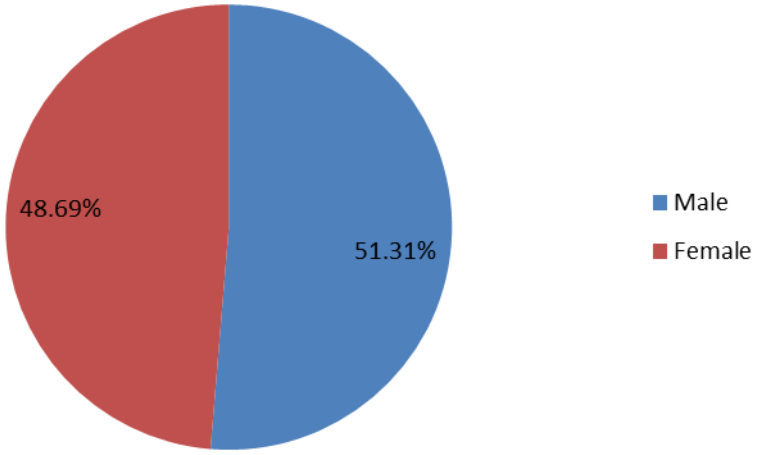

Figure 2. Sex Distribution (after IPUMS, 2000–2012)

d. Marital Status

The married and notmarried variables are binary and represent "1" for yes and "0" otherwise. For the purpose of this research, the notmarried variable includes individuals who are widowed and also divorced. The sample set demonstrates that married individuals account for 61% of the sample, as shown in Figure 3.

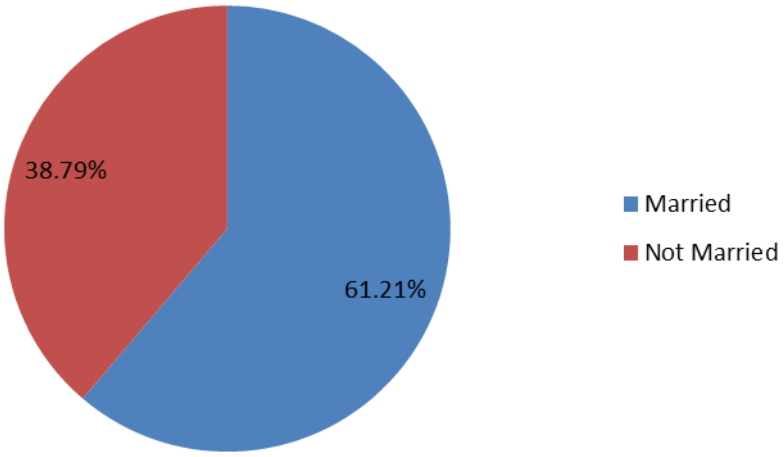

Figure 3. Marital Status Distribution (after IPUMS, 2000–2012)

e. Race

Race comprises dummy variables for white, black, and Hispanic. Whites account for 79%, blacks 10%, and Hispanics 11% in the data set, per Figure 4.

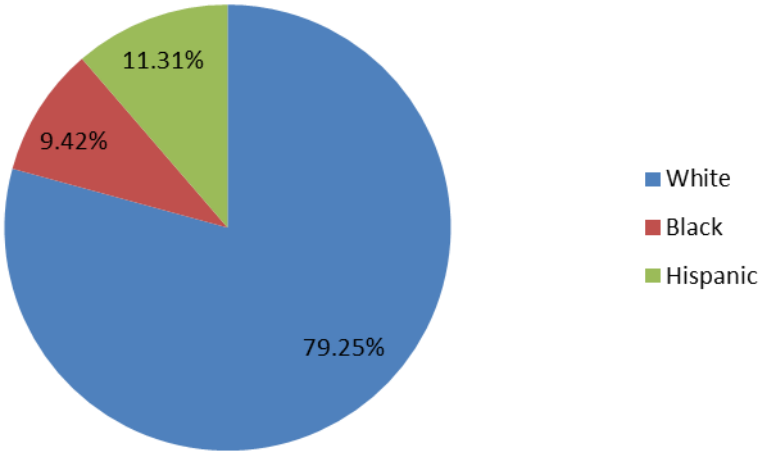

Figure 4. Race Distribution (after IPUMS, 2000–2012)

f. Citizenship Status

Citizenship status variables are dummy variables composed of UScitizen, UScitizennaturalized, and nonUScitizen. Figure 5 shows that U.S. citizens comprise 87.09% of the population set.

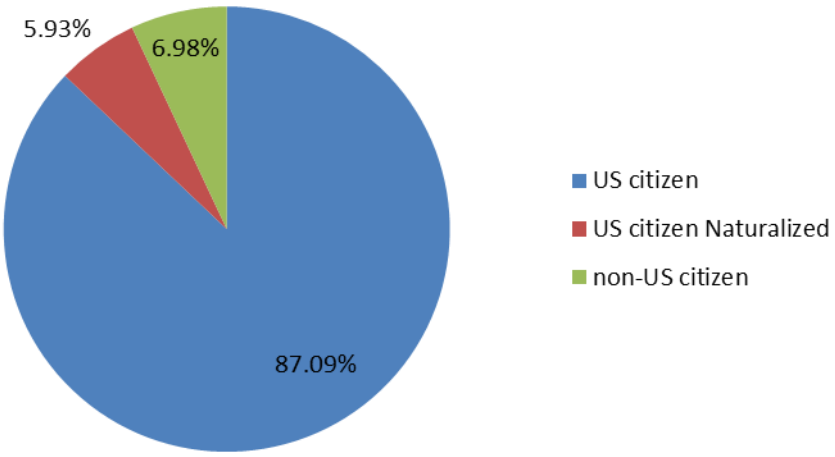

Figure 5. Citizenship Status Distribution (after IPUMS, 2000–2012)

g. Education

Educational attainment is divided into five different categories. Nohighschooldiploma identifies an individual who did not complete the educational requirements to graduate from high school. HighschooldiplomaorGED describes the completion of high school or a General Education Diploma (GED). Somecollegenodegree describes an individual who completed some college but did not complete the requirements to obtain a degree. The bachelorsassociatesdegree describes the completion of a bachelor's or associates degree. Mastersdegreeorabove describes completion of a masters or doctoral degree. Educational attainment percentages are shown in Figure 6.

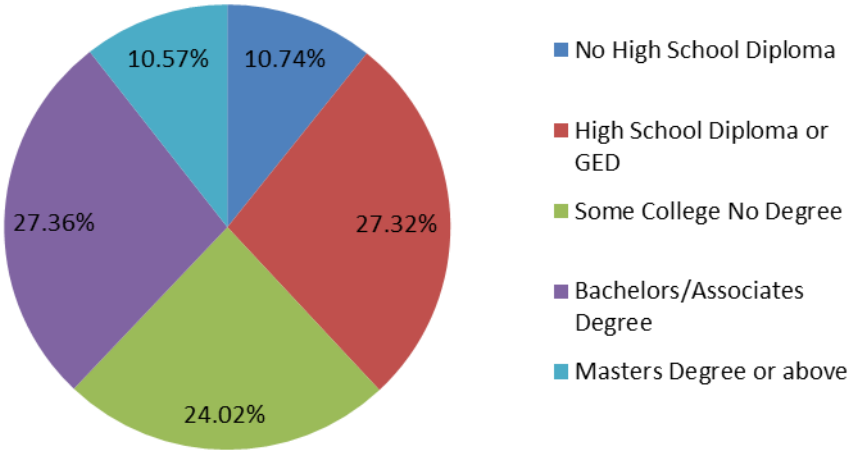

Figure 6. Educational Attainment Distribution (after IPUMS, 2000–2012)

h. Occupation

This thesis selects five occupations to include in its analysis. These variables identifying the occupational categories used are binary and are identified by "1" if yes and "0" otherwise. Occupation descriptions are per the Bureau of Labor and Statistics website. Managementoccupations describes management positions in various occupation fields from chief executive officers to emergency management directors. Busnsandfinancialoperationsocc describes positions in job fields from buyers and purchasing agents to tax preparers. Healthcarepractandtechocc includes chiropractors to athletic trainers. The variable salesandrelatedocc identifies occupations that include cashiers, travel agents, and telemarketers. The variable protectiveserviceocc accounts for professions that include law enforcement, firefighting, and private detectives. Figure 7 describes the sample set percentages of these occupations.

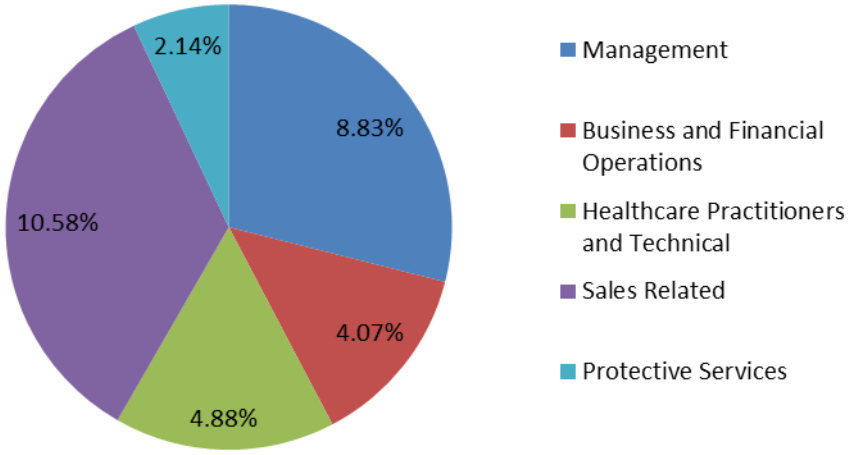

Figure 7. Occupation Distribution (after IPUMS, 2000–2012)

i. Veteran Status

The vetstaty variable is a binary variable that annotates "1" as being a veteran and "0" as being a non-veteran. This variable is the thesis's main focus, with over 1.6 million observations and accounting for 8.73% of the sample set, as Figure 8 describes.

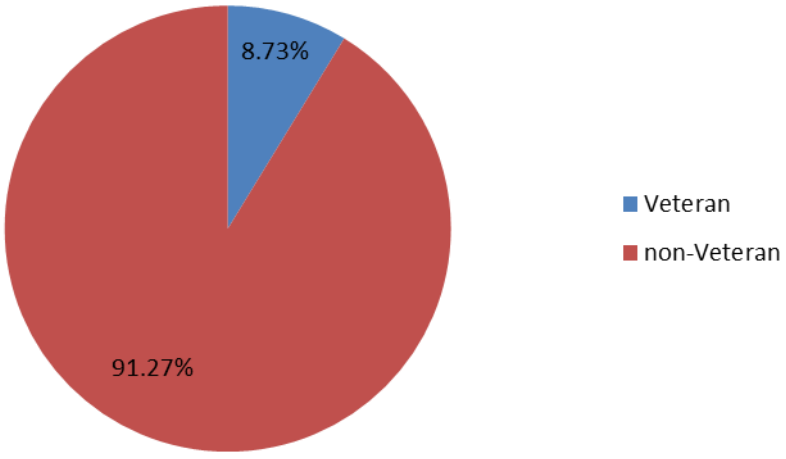

Figure 8. Veteran Status Distribution (after IPUMS, 2000–2012)

j. Veteran's Period of Service

These variables are binary, identifying if veterans served during this time period (designated as "1") or otherwise ("0"). Vet01ltry identifies veterans serving during the time period of 2001 and later, vet95x00y identifies 1995–2000, vet90x95y identifies 1990–1995, vet80x90y identifies 1980–1990, vet75x80y identifies 1975–1980, vetvietny identifies Vietnam Veterans serving 1964–1975, vet55x64y identifies 1955–1964, and vetkoreay variable identifies veterans serving 1950–1955. Veteran percentages serving during a particular time period are shown in Figure 9. The, vet47x50yidentifies 1947–1950; the sample set does not have veterans serving during this time period and is annotated for time period continuity. Vetwwiiy identifies World War II Veterans serving 1941–1946 and vetothery identifies veterans who did not identify a time period. These last two have percentages less than .09% (102 and 428 total samples, respectively) and are not annotated in Figure 9.

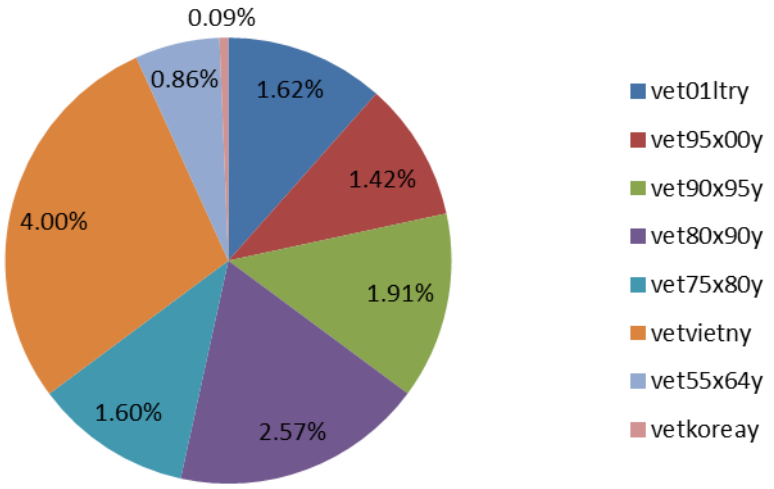

Figure 9. Veteran's Period of Service Distribution (after IPUMS, 2000–2012)

k. Veteran's Years of Service

The vetyrsmore binary variable identifies veterans serving more than two years of active service, identifying "1" for yes and "0" otherwise. The data set identifies over 1 million samples and is 8.57% of the sample set, as shown in Figure 10.

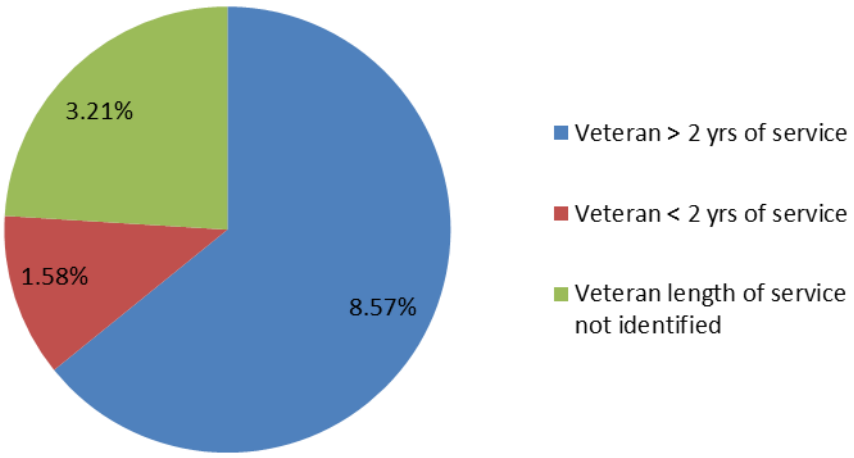

Figure 10. Veteran's Years of Service Distribution (after IPUMS, 2000–2012)

l. Weighted Variable

The perwt variable identifies how many individuals are represented by one individual in the IPUMS census data set. It is coded as a six-digit number; the last two digits are separated by an implied decimal.

m. Interaction Terms

This research will analyze a series of interaction terms in Chapter V. They are a combination of variables multiplied together and providing specific results. For example, a veteran who served for two or more years will be identified by the variable vetstatyvetyrsmore (vetstaty*vetyrsmore).

IV. STATISTICAL MODEL METHODOLOGY

A. INTRODUCTION

This chapter describes the use of models for multivariate statistical analysis. This thesis uses three models to analyze the effects of military service on veterans' earnings in the civilian labor force. Model 1 has four focal points that are used to measure this effect (log income wage) and the following groups (veteran status, educational attainment, occupation, and race). Model 1 also uses interaction terms that involve veteran status interacted with educational attainment, occupation, and race. Model 2 uses interaction terms that involve interaction with veteran status and period of service independent variables. Model 3 interacts veteran status with period of service and years of service.

B. MODEL DESIGN

This thesis uses the dependent (outcome) variable of log income wage. The dependent variable measures income in the civilian labor force. Therefore, this study will use a multivariate regression model that predicts (in percentages) the probability that being a veteran (with interaction terms) affects income in the civilian labor force.

C. REGRESSION MODELS

Model 1

This model will focus on the overall effect on earnings in the civilian labor force for being a veteran. This model also measures the effect on earnings of being a veteran when interacted with educational attainment, occupation, and race. The independent variables white for race and some college no degree for education, and their respective interaction terms, are the excluded group of this model. This model uses the aweight=perwt command to estimate sample size to the population and the robust command to correct for heteroskedasticity. Below is the regression model equation.

log income wage = β0 + β1(regions of the U.S.) + β2(age) + β3(age2) + β4(male) + β5(married) + β6(black) + β7(hispanic) + β8(citizenship category) + β9(educational attainment) + β10(occupations) + β11(veteran status) + β12(veteran status interaction terms)

a. Interaction Terms

(1) Veteran Status * No High School Diploma

(2) Veteran Status * High School Diploma or GED

(3) Veteran Status * Bachelor or Associate degree

(4) Veteran Status * Master's degree or above

(5) Veteran Status * Black

(6) Veteran Status * Hispanic

(7) Veteran Status * Management Occupations

(8) Veteran Status * Business and Financial Operations Occupations

(9) Veteran Status * Healthcare Practitioners and Technical Occupations

(10) Veteran Status * Sales and Related Occupations

(11) Veteran Status * Protective Services Occupations

Model 2

The second model focuses on the effects of earnings for being a veteran when interacted with period of service independent variables. These ten variables divide the conscription and AVF. In addition, the interaction term for Veteran 1947–1950 does not provide results and is kept for continuity purposes. The regression is the same as above except for the addition of period of service variables, per the below regression equation model.

$$\log \text{income wage} = \beta 0 + \beta 1(\text{regions of the U.S.}) + \beta 2(\text{age}) + \beta 3(\text{age2}) + \beta 4(\text{male}) + \beta 5(\text{married}) + \beta 6(\text{black}) + \beta 7(\text{hispanic}) + \beta 8(\text{citizenship category}) + \beta 9(\text{educational attainment}) + \beta 10(\text{occupations}) + \beta 11(\text{veteran status}) + \beta 12(\text{period of service}) + \beta 13(\text{veteran status interaction terms})$$

b. Interaction Terms

(1) Veteran Status * Veteran 2001 or later

(2) Veteran Status * Veteran 1995–2000

(3) Veteran Status * Veteran 1990–1995

(4) Veteran Status * Veteran 1980–1990

(5) Veteran Status * Veteran 1975–1980

(6) Veteran Status * Vietnam Veteran

(7) Veteran Status * Veteran 1955–1964

(8) Veteran Status * Veteran Korea

(9) Veteran Status * Veteran 1947–1950

(10) Veteran Status * Veteran World War II

Model 3

This last model focuses on the effects of earnings for being a veteran when interacted with period of service and years of service independent variables. The overall result for being a veteran serving two or more years of active service is documented per interaction term (1). The remaining ten variables, as per Model 2, divide the conscription and AVF. Also, the interaction term for Veteran 1947–1950 does not provide results and is kept for continuity purposes. The regression is the same as above except for the addition of years of service variables per the below regression equation model.

$$\log \text{income wage} = \beta 0 + \beta 1(\text{regions of the U.S.}) + \beta 2(\text{age}) + \beta 3(\text{age2}) + \beta 4(\text{male}) + \beta 5(\text{married}) + \beta 6(\text{black}) + \beta 7(\text{hispanic}) + \beta 8(\text{citizenship category}) + \beta 9(\text{educational attainment}) + \beta 10(\text{occupations}) + \beta 11(\text{veteran status}) + \beta 12(\text{period of service}) + \beta 13(\text{years of service}) + \beta 14(\text{veteran status interaction terms})$$

c. Interaction Terms

(1) Veteran Status * Veteran Serving 2 or more years active service

(2) Veteran 2001 or later * Veteran Serving 2 or more years active service

(3) Veteran 1995–2000 * Veteran Serving 2 or more years active service

(4) Veteran 1990–1995 * Veteran Serving 2 or more years active service

(5) Veteran 1980–1990 * Veteran Serving 2 or more years active service

(6) Veteran 1975–1980 * Veteran Serving 2 or more years active service

(7) Vietnam Veteran * Veteran Serving 2 or more years active service

(8) Veteran 1955–1964 * Veteran Serving 2 or more years active service

(9) Veteran Korea * Veteran Serving 2 or more years active service

(10) Veteran 1947–1950 * Veteran Serving 2 or more years active service

(11) Veteran World War II * Veteran Serving 2 or more years active service

V. MULTIVARIATE RESULTS

A. INTRODUCTION

This chapter presents and discusses the results of the three multiple regression models that examine the relation between military service and civilian labor market earnings. This chapter will only display the results of select independent variables that are discussed for analysis. The full set of regression results for each model can be found in the Appendix.

B. EDUCATION, RACE, OCCUPATION

This analysis begins with the analysis of the overall effect of veteran status and its interactions with educational attainment, race, and occupation, as identified in Table 2.

Table 2. Model 1 Multiple Regression Results
(after IPUMS, 2000–2012)

Dependent Variable	Model 1
logincwage	
Independent Variables	
Education/Race	
nohighschooldiploma	-0.3949***
	[0.0015]
highschooldiplomaorGED	-0.0912***
	[0.0010]
bachelorsassociatesdegree	0.3086***
	[0.0010]
mastersdegreeorabove	0.6318***
	[0.0012]
black	-0.0907***
	[0.0013]
hispanic	0.0014
	[0.0013]
Occupation/Veteran Status	
managementoccupations	0.5614***
	[0.0011]
busnsandfinancialoperationsocc	0.4481***
	[0.0015]
healthcarepractandtechocc	0.4387***
	[0.0014]
salesandrelatedocc	0.0194***
	[0.0013]
protectiveserviceocc	0.1551***
	[0.0025]
vetstaty	0.0831***
	[0.0023]

Table 2. Model 1 Multiple Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms	
Veteran Status/Education	
vetstatynohsdiploma	0.0753***
	[0.0065]
vetstatyhsdipGED	-0.0165***
	[0.0029]
vetstatyassoctebacc	-0.1287***
	[0.0029]
vetstatymstrdoc	-0.1258***
	[0.0041]
Veteran Status/Race	
vetstatyblack	-0.0502***
	[0.0039]
vetstatyhispanic	-0.0350***
	[0.0046]
Veteran Status/Occupation	
vetstatymgmtocc	-0.0622***
	[0.0034]
vetstatybusfinops	-0.1545***
	[0.0052]
vetstatyhlthcare	0.0127**
	[0.0057]
vetstatysales	0.0302***
	[0.0044]
vetstatyprotectsrv	-0.0258***
	[0.0048]
Constant	6.1030***
	[0.0045]
Observations	19,391,987
R-squared	0.325
AdjR2	0.325
Robust standard errors in brackets	
*** p<0.01, ** p<0.05, * p<0.1	

Model 1

This model focuses on the overall effect of veteran status on earnings in the civilian labor force, along with the interaction of veteran status with educational attainment, a set of five occupations, and race. Model 1 identifies that all independent variables are statistically significant, with the exception of the hispanic independent variable (p-value = 0.263); that variable is statistically significant when interacted with veteran status. The overall effect results in a premium of increased earnings by 8.3%.

The educational attainment variables yield premiums of 15.8% and 6.7% for veterans who dropped out of high school and who obtained a high school diploma, respectively. Model 1 also shows that having an associates or bachelor's degree results in an income penalty of 4.6% for veterans, along with having a master's degree or higher of 4.3%. Additionally, veterans employed in the following occupations earn premiums: managers 2.1%, healthcare 9.6%, sales 11.3%, and protective services 5.7%. The only occupation that produces a penalty for veterans' earnings is business and financial operations at 7.1%. Lastly, for this model black and Hispanic veterans earn premiums of 3.3% and 4.8%, respectively.

The overall long-run results of Model 1 are consistent with Loughran et al. (2011), Martorell et al. (2013), and Hirsch and Mehay (2003) (officers only), as these results produce a premium between 8–11%. When controlling for race, this model is more conservative and consistent with Hirsch and Mehay (2003) than Loughran et al. (2011). This is because the research conducted by Loughran et al. (2011) produces a premium of 22% for blacks and 11% for Hispanics, whereas Model 1 produces more modest results of 3.3% and 4.8%, respectively. Furthermore, this model shows more modest results compared to Martorell et al. (2013) with respect to occupations. For example, Martorell et al. (2013) find that veterans in the healthcare field will earn premiums of 35% more than their counterparts, whereas this model generates estimates of 9.6%.

C. PERIOD OF SERVICE

Table 3 displays regression results for the general veteran status independent variable and associated independent variables for period of service and interaction terms.

Table 3. Model 2 Multiple Regression Results
(after IPUMS, 2000–2012)

Dependent Variable	Model 2
logincwage	
Independent Variables	
Veteran Status	
vetstaty	0.0093***
	[0.0015]
Period of Service	
vet01ltry	0.5425***
	[0.0028]
vet95x00y	0.3006***
	[0.0055]
vet90x95y	0.2408***
	[0.0057]
vet80x90y	0.2616***
	[0.0040]
vet75x80y	0.2208***
	[0.0111]
vetvietny	0.2385***
	[0.0223]
vet55x64y	0.2376***
	[0.0797]
vetkoreay	0.2401***
	[0.0014]

Table 3. Model 2 Multiple Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms	
Veteran Status/Period of Service	
vetstatyvet01ltry	-0.4340***
	[0.0045]
vetstatyvet95x00y	-0.2478***
	[0.0088]
vetstatyvet90x95y	-0.2224***
	[0.0079]
vetstatyvet80x90y	-0.3243***
	[0.0045]
vetstatyvet75x80y	-0.3216***
	[0.0114]
vetstatyvetvietny	-0.2498***
	[0.0224]
vetstatyvet55x64y	-0.2983***
	[0.0798]
vetstatyvetkoreay	-0.5568***
	[0.0187]
vetstatyvetwwiiy	-0.4013***
	[0.1180]
Constant	6.0301***
	[0.0050]
Observations	11,909,939
R-squared	0.33
AdjR2	0.33
Robust standard errors in brackets	
*** p<0.01, ** p<0.05, * p<0.1	

Model 2

Model 2 focuses on the effect of veterans' earnings in the civilian labor force with respect to their period of service. These variables are statistically significant at the 1% level. The period with the most earnings impact for veterans is the period of military service from 2001 and later, with a premium of 11.8%. Furthermore, this model shows that the AVF era produces an average earnings premium for veterans of 2.6% in the civilian labor market. In reality, this is not significant as this earnings premium interprets as being close to zero. The earnings for veterans during conscription produce an average penalty of 18%, thus disproving the hypothesis that veterans statistically earn more than non-veterans.

The literature review focuses on the AVF, with Hirsch and Mehay (2003) highlighting Vietnam Veterans. The average of the AVF periods of Model 2 produces a premium of 2.6% and is inconsistent with the estimates of Loughran et al. (2011), Martorell et al. (2013), and Davila and Mora (2012). The only consistencies that present themselves are the AVF periods of 2001 and later (11.8%) and 1995–2000 (7.1%), which are comparatively similar to the overall results from the research of Loughran et al. (2011), Martorell et al. (2013), and Hirsch and Mehay (2003) (officers only). On the other hand, this model's control variable average is consistent with Hirsch and Mehay's (2003) (enlisted only) study (3%) and also with their calculations for Vietnam Veterans (negative 1.5%). These results can be interpreted as essentially having a zero effect for veterans' earnings in the civilian labor market.

D. PERIOD AND YEARS OF SERVICE

Table 4 displays regression results for the general veteran status independent variable and associated independent variables for period and years of service interaction terms.

Table 4. Model 3 Multiple Regression Results
(after IPUMS, 2000–2012)

Dependent Variable	Model 3
logincwage	
Independent Variables	
Veteran Status/Years of Service	
vetstaty	-0.0173***
	[0.0039]
vetyrsmore	0.4068***
	[0.0034]
Period of Service	
vet01ltry	0.2405***
	[0.0118]
vet95x00y	0.1163***
	[0.0174]
vet90x95y	0.1160***
	[0.0176]
vet80x90y	-0.0414***
	[0.0099]
vet75x80y	-0.1410***
	[0.0132]
vetvietny	0.1782***
	[0.0065]
vet55x64y	0.1298***
	[0.0137]
vetkoreay	-0.0968*
	[0.0549]
vetwwiiy	-0.0979
	[0.3674]

Table 4. Model 3 Multiple Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms	
Period of Service/Years of Service	
vetstatyvetyrsmore	-0.3574***
	[0.0053]
vet01ltryvetyrsmore	-0.0313**
	[0.0132]
vet95x00yvetyrsmore	-0.0016
	[0.0189]
vet90x95yvetyrsmore	-0.0913***
	[0.0187]
vet80x90yvetyrsmore	-0.0383***
	[0.0104]
vet75x80yvetyrsmore	0.0063
	[0.0136]
vetvietnyvetyrsmore	-0.2150***
	[0.0068]
vet55x64yvetyrsmore	-0.1600***
	[0.0146]
vetkoreayvetyrsmore	-0.1862***
	[0.0583]
vetwwiiyvetyrsmore	-0.2878
	[0.3860]
Constant	6.1159***
	[0.0062]
Observations	12,683,778
R-squared	0.32
AdjR2	0.32
Robust standard errors in brackets	
*** p<0.01, ** p<0.05, * p<0.1	

Model 3

This model follows the same regression pattern as Model 2; it focuses on the effect of veterans' earnings in the civilian labor market with the addition of YOS. As previously mentioned, the YOS variable controls for active service of two years and greater. This model produces three statistically insignificant interaction terms for veteran periods 1995–2000, 1975–1980, and WWII Veterans, with p-values of 0.934, 0.643, and 0.177, respectively. The overall effect of military service on earnings in the civilian labor market for veterans is a premium of 3.2%. Surprisingly, Model 3 produces a premium of 23.1% for veterans serving during 2001 and later for two or more years of active service. This large premium is statistically significant at the 5% level. On average, the AVF produces a premium of 12%, which proves the hypothesis that veterans do earn more than observationally similar non-veterans. The conscription terms result in an average penalty of 6.5% for veterans serving two or more years of active service during this period, which is almost a third of the penalty as shown in Model 2.

The one article that discusses YOS is Martorell et al. (2013). Interestingly enough, this model has two documented consistencies with this research. The first is that the 2001 and later control variable is consistent with the YOS variable that includes YOS 4–12, which indicates a positive return on veterans' earnings that exceed 20% (Martorell et al., 2013). Second, the overall AVF results of Model 3 are consistent with not only the research of Martorell et al. (2013) but also Loughran et al. (2011) and Hirsch and Mehay (2003) (officers only).

VI. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter presents conclusions and recommendations. Using data from IPUMS 2000–2012, this thesis addressed two questions pertaining to the effects of veterans' earnings in the civilian labor force.

1. Does prior military service have an effect on earnings potential in the civilian labor force?
2. Do veterans earn more after service completion than observationally similar non-veterans?

B. CONCLUSIONS

This research clearly identifies an impact on veterans' earnings potential in the civilian labor force. The effect varies depending on certain demographics, time period, and the amount of time a veteran serves. The overall effect of military service on veterans' earnings in the civilian labor force is 8.3% and mirrors the results of Martorell et al. (2013), Loughran et al. (2011), and Hirsch and Mehay (2003), which identify a premium of veterans' earnings between 8% and 11% over the long-run. This research also identifies a more modest premium for service members serving two or more years of active service at 3.2%, which is also comparable to short-run results.

Educational attainment is a focal point of this research, as the literature review does not entertain the differentiation of educational attainment and focuses mostly on enlisted personnel who have a high school education. The results in this study are similar to previous research with respect to veterans who have only attained a high school education. This research identifies an overall income premium of 6.7% for veterans when compared to non-veterans having attained a high school diploma. Not having a high school diploma also shows a much higher premium of 15.8%. This makes perfect sense as a high school dropout who has never served would, on average, have lower human capital and would thus be working for much lower wages than his veteran counterpart.

Furthermore, attainment of higher educational degrees may be delayed per the research conducted by Martorell et al. (2013) and Loughran et al. (2011) for enlisted

members because of their service versus attending college after high school. Surprisingly, this thesis finds that veterans with an associate's degree or bachelor's degree on average statistically earn 4.6% less than non-veterans with the same degree. In addition, a veteran with a master's degree or higher also earns less by 4.3%. This may pose challenges for recruiting and retention of individuals with this level of education.

Occupations are also a key area of this research and closely resemble the income premiums (8–11%) from the research of Martorell et al. (2013) for healthcare (9.6%) and sales occupations (11.3%). This thesis also finds premium returns for management occupations (2.1%) and protective services (5.7%). Veterans in business and financial operations have a penalty of 5.7%. The latter makes sense considering educational attainment, but still poses uncertainty when referring to other occupations that require higher learning as well.

Research from Davila and Mora (2012) identifies an increase in wages for post 9/11 Hispanics in the short-run. Although this thesis considers the long-run, it also concludes that Hispanics and blacks observe premiums of 4.8% and 3.3%, respectively, relative to non-veterans of the same race.

The most notable results for the period of service variables are an average premium of 12% for the AVF. This is also similar to the results of previous work as stated above. The previous years of the AVF yield penalties with gains post 1980, along with penalties for service during the conscription period with the exception of Vietnam service with a .08% premium, which interprets to essentially zero.

The period and years of service variables yield mixed results along with non-existent statistical significance for the 1995–2000 and 1975–1980 variables of the AVF and WWII for the conscription period. The most interesting result for this variable is that veterans serving 2001 and later with two or more years of active service have a 23.1% premium in earnings over non-veteran counterparts.

Within the specific categories of this research, the results are very similar when comparing veteran earnings to non-veterans in the civilian labor force. In some instances, post-service veterans do earn more than their observationally similar civilian

counterparts, as the variable for 2001 and later with two or more years of active service identifies. This research's findings are very similar and remain very close in the range of 8–11% that previous research identifies. In addition, there are variables within this research that fall below this threshold, as the interaction term for veterans with a high school diploma or GED identifies. Therefore, there is no solid yes or no answer to this question.

C. RECOMMENDATIONS

Opportunities exist in continuing to explore the effects of military service on the civilian labor market. Even with the vast amount of data collection that takes place from the military and also the civilian sector, there still exists a gap in data collection that can provide more accuracy. The Angrist (1998) model uses individuals with the same characteristics and differentiates between those who enlist and do not enlist, then compares the effects of earnings in the civilian labor force. This model uses data from veterans in the U.S. Census and compares the effects of previous military service on earnings in the civilian labor force. Although the results are comparatively similar in a general sense, it is recommended that DMDC and the Total Force Data Warehouse (TFDW) track earnings for veterans (both officer and enlisted) once they are released from active duty.

This thesis also provides the next step for continuous research by the Department of Defense regarding recruiting and retention. The majority of previous research uses enlisted service members as a focal point because of their overall quantity versus a smaller service population for officers. Additional research with specific MOS's and designators will provide a thorough understanding to the services of what is required to retain both officers and enlisted, in addition to making service income more attractive because of the identified income gains in the civilian labor force post-service.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX

Table 5. Overall Model 1 Regression Results (after IPUMS, 2000–2012)

Dependent Variable	Model 1
logincwage	
Independent Variables	
Region/Age/Sex/Marital Status	
newyorknewjerseyregion	0.0340***
	[0.0017]
midatlanticregion	-0.0318***
	[0.0017]
southeastregion	-0.1214***
	[0.0015]
midwestregion	-0.1038***
	[0.0015]
southwestregion	-0.1018***
	[0.0017]
mountainplainsregion	-0.1322***
	[0.0019]
westernregion	-0.0279***
	[0.0016]
age	0.1625***
	[0.0002]
agesquared	-0.0017***
	[0.0000]
male	0.4721***
	[0.0007]
married	0.1175***
	[0.0007]
Race/Citizenship	
black	-0.0907***
	[0.0013]
hispanic	0.0014
	[0.0013]
UScitizen	0.1284***
	[0.0015]
Uscitizennaturalized	0.1284***
	[0.0015]

Table 5. Overall Model 1 Regression Results
(continued, [after IPUMS, 2000–2012])

Education	
nohighschooldiploma	-0.3949***
	[0.0015]
highschooldiplomaorGED	-0.0912***
	[0.0010]
bachelorsassociatesdegree	0.3086***
	[0.0010]
mastersdegreeorabove	0.6318***
	[0.0012]
Occupation	
managementoccupations	0.5614***
	[0.0011]
busnsandfinancialoperationsocc	0.4481***
	[0.0015]
healthcarepractandtechocc	0.4387***
	[0.0014]
salesandrelatedocc	0.0194***
	[0.0013]
protectiveserviceocc	0.1551***
	[0.0025]
Veteran Status	
vetstaty	0.0831***
	[0.0023]

Table 5. Overall Model 1 Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms	
Veteran Status/Education	
vetstatynohsdiploma	0.0753***
	[0.0065]
vetstatyhsdipGED	-0.0165***
	[0.0029]
vetstatyassoctebacc	-0.1287***
	[0.0029]
vetstatymstrdoc	-0.1258***
	[0.0041]
Veteran Status/Race	
vetstatyblack	-0.0502***
	[0.0039]
vetstatyhispanic	-0.0350***
	[0.0046]
Veteran Status/Occupation	
vetstatymgmtocc	-0.0622***
	[0.0034]
vetstatybusfinops	-0.1545***
	[0.0052]
vetstatyhlthcare	0.0127**
	[0.0057]
vetstatysales	0.0302***
	[0.0044]
vetstatyprotectsrv	-0.0258***
	[0.0048]
Constant	6.1030***
	[0.0045]
Observations	19,391,987
R-squared	0.325
AdjR2	0.325
Robust standard errors in brackets	
*** p<0.01, ** p<0.05, * p<0.1	

Table 6. Overall Model 2 Regression Results
(after IPUMS, 2000–2012)

Dependent Variable	Model 2									
logincwage										
Independent Variables										
Region/Age/Sex/Marital Status										
newyorknewjerseyregion	0 0385***	0 0248***	0 0247***	0 0344***	0 0343***	0 0344***	0 0344***	0 0344***	0 0344***	0 0344***
	[0 0020]	[0 0038]	[0 0038]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]
midatlanticregion	-0 0297***	-0 0602***	-0 0592***	-0 0328***	-0 0324***	-0 0325***	-0 0326***	-0 0325***	-0 0325***	-0 0325***
	[0 0019]	[0 0036]	[0 0036]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]
southeastregion	-0 1264***	-0 1241***	-0 1232***	-0 1221***	-0 1219***	-0 1221***	-0 1222***	-0 1221***	-0 1221***	-0 1221***
	[0 0017]	[0 0033]	[0 0033]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]
midwestregion	-0 1092***	-0 0866***	-0 0869***	-0 1040***	-0 1042***	-0 1041***	-0 1041***	-0 1041***	-0 1041***	-0 1041***
	[0 0017]	[0 0032]	[0 0032]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]
southwestregion	-0 0984***	-0 1327***	-0 1318***	-0 1027***	-0 1024***	-0 1026***	-0 1026***	-0 1026***	-0 1026***	-0 1026***
	[0 0019]	[0 0038]	[0 0038]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]
mountainplainsregion	-0 1327***	-0 1475***	-0 1471***	-0 1330***	-0 1328***	-0 1330***	-0 1331***	-0 1330***	-0 1330***	-0 1330***
	[0 0021]	[0 0041]	[0 0041]	[0 0019]	[0 0019]	[0 0019]	[0 0019]	[0 0019]	[0 0019]	[0 0019]
westernregion	-0 0263***	-0 0503***	-0 0495***	-0 0288***	-0 0285***	-0 0287***	-0 0287***	-0 0287***	-0 0287***	-0 0287***
	[0 0018]	[0 0034]	[0 0034]	[0 0016]	[0 0016]	[0 0016]	[0 0016]	[0 0016]	[0 0016]	[0 0016]
age	0 1667***	0 1553***	0 1549***	0 1634***	0 1632***	0 1629***	0 1627***	0 1628***	0 1630***	0 1630***
	[0 0002]	[0 0005]	[0 0005]	[0 0002]	[0 0002]	[0 0002]	[0 0002]	[0 0002]	[0 0002]	[0 0002]
agesquared	-0 0018***	-0 0017***	-0 0017***	-0 0018***	-0 0018***	-0 0017***	-0 0017***	-0 0017***	-0 0017***	-0 0017***
	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]
male	0 4554***	0 5113***	0 5124***	0 4714***	0 4722***	0 4724***	0 4724***	0 4723***	0 4723***	0 4723***
	[0 0008]	[0 0017]	[0 0017]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]
married	0 1232***	0 0892***	0 0904***	0 1167***	0 1170***	0 1173***	0 1175***	0 1174***	0 1173***	0 1173***
	[0 0008]	[0 0017]	[0 0017]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]	[0 0007]
Race/Citizenship										
black	-0 1018***	-0 0884***	-0 0878***	-0 0960***	-0 0959***	-0 0962***	-0 0962***	-0 0961***	-0 0961***	-0 0961***
	[0 0014]	[0 0029]	[0 0029]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]
hispanic	-0 0023*	-0 0237***	-0 0237***	-0 0028**	-0 0028**	-0 0028**	-0 0028**	-0 0028**	-0 0028**	-0 0028**
	[0 0013]	[0 0031]	[0 0031]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]
UScitizen	0 1234***	0 1383***	0 1394***	0 1280***	0 1283***	0 1283***	0 1282***	0 1283***	0 1283***	0 1283***
	[0 0016]	[0 0037]	[0 0037]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]
Uscitizennaturalized	0 1325***	0 1538***	0 1547***	0 1409***	0 1407***	0 1406***	0 1405***	0 1407***	0 1408***	0 1408***
	[0 0019]	[0 0046]	[0 0046]	[0 0018]	[0 0018]	[0 0018]	[0 0018]	[0 0018]	[0 0018]	[0 0018]

Table 6. Overall Model 2 Regression Results
(continued, [after IPUMS, 2000–2012])

Education										
nohighschooldiploma	-0 3889***	-0 3839***	-0 3856***	-0 3951***	-0 3954***	-0 3955***	-0 3954***	-0 3954***	-0 3955***	-0 3955***
	[0 0017]	[0 0032]	[0 0032]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]	[0 0015]
highschooldiplomaorGED	-0 0881***	-0 0983***	-0 0989***	-0 0930***	-0 0933***	-0 0932***	-0 0932***	-0 0932***	-0 0933***	-0 0933***
	[0 0011]	[0 0021]	[0 0021]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]
bachelorsassociatesdegree	0 3017***	0 2697***	0 2695***	0 2969***	0 2971***	0 2971***	0 2971***	0 2971***	0 2970***	0 2970***
	[0 0010]	[0 0021]	[0 0021]	[0 0009]	[0 0009]	[0 0009]	[0 0009]	[0 0009]	[0 0009]	[0 0009]
mastersdegreeorabove	0 6344***	0 5513***	0 5512***	0 6202***	0 6206***	0 6204***	0 6203***	0 6204***	0 6204***	0 6204***
	[0 0013]	[0 0027]	[0 0027]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]
Occupation										
managementoccupations	0 5687***	0 5248***	0 5235***	0 5560***	0 5552***	0 5552***	0 5552***	0 5552***	0 5552***	0 5552***
	[0 0011]	[0 0024]	[0 0024]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]
busnsandfinancialoperationsocc	0 4501***	0 3989***	0 3977***	0 4363***	0 4356***	0 4358***	0 4358***	0 4357***	0 4357***	0 4357***
	[0 0016]	[0 0033]	[0 0033]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]
healthcarepractandtechocc	0 4661***	0 3498***	0 3489***	0 4405***	0 4397***	0 4398***	0 4398***	0 4398***	0 4398***	0 4398***
	[0 0015]	[0 0033]	[0 0033]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]
salesandrelatedocc	0 0275***	0 0154***	0 0138***	0 0210***	0 0205***	0 0206***	0 0206***	0 0206***	0 0206***	0 0206***
	[0 0013]	[0 0028]	[0 0028]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]	[0 0012]
protectiveserviceocc	0 1636***	0 1112***	0 1098***	0 1519***	0 1504***	0 1505***	0 1506***	0 1508***	0 1508***	0 1508***
	[0 0023]	[0 0050]	[0 0050]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]
Veteran Status/Period of Service										
vetstaty	0 0093***	0 0184***	0 0202***	0 0345***	0 0330***	0 0192***	0 0187***	0 0159***	0 0148***	0 0148***
	[0 0015]	[0 0025]	[0 0026]	[0 0014]	[0 0013]	[0 0015]	[0 0012]	[0 0012]	[0 0012]	[0 0012]
vet01ltry	0 5425***									
	[0 0028]									
vet95x00y		0 3006***								
		[0 0055]								
vet90x95y			0 2408***							
			[0 0057]							
vet80x90y				0 2616***						
				[0 0040]						
vet75x80y					0 2208***					
					[0 0111]					
vetvietny						0 2385***				
						[0 0223]				
vet55x64y							0 2376***			
							[0 0797]			
vetkoreay								0 2401***		
								[0 0014]		

Table 6. Overall Model 2 Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms										
Veteran Status/Period of Service										
vetstatyvet01ltry	-0 4340***									
	[0 0045]									
vetstatyvet95x00y		-0 2478***								
		[0 0088]								
vetstatyvet90x95y			-0 2224***							
			[0 0079]							
vetstatyvet80x90y				-0 3243***						
				[0 0045]						
vetstatyvet75x80y					-0 3216***					
					[0 0114]					
vetstatyvetvietny						-0 2498***				
						[0 0224]				
vetstatyvet55x64y							-0 2983***			
							[0 0798]			
vetstatyvetkoreay								-0 5568***		
								[0 0187]		
vetstatyvetwwiiy									-0 4013***	
									[0 1180]	
Constant	6 0301***	6 2599***	6 2673***	6 0949***	6 0968***	6 1030***	6 1064***	6 1036***	6 1014***	6 1015***
	[0 0050]	[0 0104]	[0 0104]	[0 0045]	[0 0045]	[0 0045]	[0 0045]	[0 0045]	[0 0045]	[0 0045]
Observations	11,909,939	7,482,048	7,482,048	19,391,987	19,391,987	19,391,987	19,391,987	19,391,987	19,391,987	19,391,987
R-squared	0 33	0 315	0 315	0 325	0 325	0 325	0 325	0 325	0 325	0 325
AdjR2	0 33	0 315	0 315	0 325	0 325	0 325	0 325	0 325	0 325	0 325
Robust standard errors in brackets										
*** p<0 01, ** p<0 05, * p<0 1										

Table 7. Overall Model 3 Regression Results
(after IPUMS, 2000–2012)

Dependent Variable	Model 3									
logincwage										
Independent Variables										
Region/Age/Sex/Marital Status										
newyorknewjerseyregion	0 0283***	0 0310***	0 0248***	0 0248***	0 0281***	0 0281***	0 0282***	0 0282***	0 0282***	0 0282***
	[0 0024]	[0 0030]	[0 0038]	[0 0038]	[0 0024]	[0 0024]	[0 0024]	[0 0024]	[0 0024]	[0 0024]
midatlanticregion	-0 0460***	-0 0390***	-0 0600***	-0 0592***	-0 0444***	-0 0445***	-0 0452***	-0 0450***	-0 0450***	-0 0449***
	[0 0023]	[0 0029]	[0 0036]	[0 0036]	[0 0023]	[0 0023]	[0 0023]	[0 0023]	[0 0023]	[0 0023]
southeastregion	-0 1166***	-0 1138***	-0 1240***	-0 1234***	-0 1154***	-0 1155***	-0 1161***	-0 1159***	-0 1159***	-0 1158***
	[0 0021]	[0 0027]	[0 0033]	[0 0033]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]
midwestregion	-0 0932***	-0 0978***	-0 0867***	-0 0868***	-0 0934***	-0 0935***	-0 0934***	-0 0934***	-0 0935***	-0 0935***
	[0 0020]	[0 0026]	[0 0032]	[0 0032]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]
southwestregion	-0 1279***	-0 1263***	-0 1326***	-0 1320***	-0 1270***	-0 1268***	-0 1273***	-0 1272***	-0 1273***	-0 1272***
	[0 0023]	[0 0030]	[0 0038]	[0 0038]	[0 0024]	[0 0023]	[0 0024]	[0 0024]	[0 0024]	[0 0024]
mountainplainsregion	-0 1399***	-0 1371***	-0 1475***	-0 1471***	-0 1392***	-0 1391***	-0 1396***	-0 1395***	-0 1395***	-0 1395***
	[0 0025]	[0 0033]	[0 0041]	[0 0041]	[0 0025]	[0 0025]	[0 0025]	[0 0025]	[0 0025]	[0 0025]
westernregion	-0 0315***	-0 0213***	-0 0502***	-0 0497***	-0 0305***	-0 0305***	-0 0309***	-0 0307***	-0 0307***	-0 0307***
	[0 0021]	[0 0027]	[0 0034]	[0 0034]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]
age	0 1622***	0 1671***	0 1552***	0 1549***	0 1629***	0 1627***	0 1620***	0 1621***	0 1620***	0 1622***
	[0 0003]	[0 0004]	[0 0005]	[0 0005]	[0 0003]	[0 0003]	[0 0003]	[0 0003]	[0 0003]	[0 0003]
agesquared	-0 0018***	-0 0018***	-0 0017***	-0 0017***	-0 0018***	-0 0018***	-0 0018***	-0 0018***	-0 0018***	-0 0018***
	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]	[0 0000]
male	0 4948***	0 4864***	0 5123***	0 5125***	0 4962***	0 4965***	0 4961***	0 4965***	0 4966***	0 4966***
	[0 0010]	[0 0012]	[0 0016]	[0 0016]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]
married	0 1022***	0 1109***	0 0896***	0 0902***	0 1033***	0 1030***	0 1032***	0 1035***	0 1036***	0 1035***
	[0 0010]	[0 0013]	[0 0017]	[0 0017]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]	[0 0010]
Race/Citizenship										
black	-0 0995***	-0 1079***	-0 0888***	-0 0883***	-0 0990***	-0 0991***	-0 0995***	-0 0994***	-0 0993***	-0 0993***
	[0 0017]	[0 0022]	[0 0029]	[0 0029]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]
hispanic	-0 0079***	-0 0029	-0 0238***	-0 0239***	-0 0082***	-0 0080***	-0 0081***	-0 0081***	-0 0081***	-0 0081***
	[0 0018]	[0 0022]	[0 0031]	[0 0031]	[0 0018]	[0 0018]	[0 0018]	[0 0018]	[0 0018]	[0 0018]
UScitizen	0 1276***	0 1241***	0 1390***	0 1395***	0 1296***	0 1294***	0 1288***	0 1292***	0 1292***	0 1293***
	[0 0021]	[0 0026]	[0 0037]	[0 0037]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]	[0 0021]
Uscitizennaturalized	0 1400***	0 1308***	0 1538***	0 1546***	0 1414***	0 1409***	0 1406***	0 1408***	0 1408***	0 1409***
	[0 0026]	[0 0032]	[0 0046]	[0 0046]	[0 0026]	[0 0026]	[0 0026]	[0 0026]	[0 0026]	[0 0026]

Table 7. Overall Model 3 Regression Results
(continued, [after IPUMS, 2000–2012])

Education										
nohighschooldiploma	-0 3923***	-0 3960***	-0 3843***	-0 3852***	-0 3940***	-0 3938***	-0 3936***	-0 3939***	-0 3938***	-0 3939***
	[0 0020]	[0 0026]	[0 0032]	[0 0032]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]
highschooldiplomaorGED	-0 0912***	-0 0883***	-0 0985***	-0 0989***	-0 0924***	-0 0924***	-0 0919***	-0 0921***	-0 0922***	-0 0922***
	[0 0013]	[0 0016]	[0 0021]	[0 0021]	[0 0013]	[0 0013]	[0 0013]	[0 0013]	[0 0013]	[0 0013]
bachelorsassociatesdegree	0 2842***	0 2895***	0 2698***	0 2695***	0 2838***	0 2840***	0 2841***	0 2840***	0 2840***	0 2840***
	[0 0013]	[0 0016]	[0 0021]	[0 0021]	[0 0013]	[0 0013]	[0 0013]	[0 0013]	[0 0013]	[0 0013]
mastersdegreeorabove	0 5854***	0 6005***	0 5512***	0 5515***	0 5861***	0 5862***	0 5855***	0 5855***	0 5856***	0 5856***
	[0 0016]	[0 0021]	[0 0027]	[0 0027]	[0 0016]	[0 0016]	[0 0016]	[0 0016]	[0 0016]	[0 0016]
Occupation										
managementoccupations	0 5518***	0 5657***	0 5240***	0 5234***	0 5496***	0 5495***	0 5502***	0 5498***	0 5498***	0 5497***
	[0 0014]	[0 0018]	[0 0024]	[0 0024]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]	[0 0014]
busnsandfinancialoperationsocc	0 4223***	0 4336***	0 3980***	0 3975***	0 4201***	0 4200***	0 4207***	0 4204***	0 4204***	0 4203***
	[0 0020]	[0 0025]	[0 0033]	[0 0033]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]	[0 0020]
healthcarepractandtechocc	0 4036***	0 4309***	0 3488***	0 3485***	0 4017***	0 4016***	0 4024***	0 4020***	0 4019***	0 4019***
	[0 0019]	[0 0024]	[0 0033]	[0 0033]	[0 0019]	[0 0019]	[0 0019]	[0 0019]	[0 0019]	[0 0019]
salesandrelatedocc	0 0269***	0 0330***	0 0149***	0 0140***	0 0252***	0 0251***	0 0257***	0 0253***	0 0253***	0 0253***
	[0 0017]	[0 0021]	[0 0028]	[0 0028]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]	[0 0017]
protectiveserviceocc	0 1306***	0 1355***	0 1091***	0 1087***	0 1284***	0 1274***	0 1282***	0 1279***	0 1279***	0 1278***
	[0 0030]	[0 0037]	[0 0050]	[0 0050]	[0 0030]	[0 0030]	[0 0030]	[0 0030]	[0 0030]	[0 0030]
Veteran Status/Period of Service										
vetstaty	-0 0173***	-0 0999***	-0 0633***	-0 0821***	-0 0986***	-0 0881***	-0 1549***	-0 1116***	-0 1026***	-0 1030***
	[0 0039]	[0 0044]	[0 0053]	[0 0052]	[0 0033]	[0 0032]	[0 0038]	[0 0032]	[0 0031]	[0 0031]
vet01ltry		0 2405***								
		[0 0118]								
vet95x00y			0 1163***							
			[0 0174]							
vet90x95y				0 1160***						
				[0 0176]						
vet80x90y					-0 0414***					
					[0 0099]					
vet75x80y						-0 1410***				
						[0 0132]				
vetvietny							0 1782***			
							[0 0065]			
vet55x64y								0 1298***		
								[0 0137]		
vetkoreay									-0 0968*	
									[0 0549]	
vetwwiiy										-0 0979
										[0 3674]
Veteran Status/Years of Service										
vetyrsmore	0 4068***	0 1217***	0 0871***	0 1184***	0 1699***	0 1601***	0 2142***	0 1601***	0 1502***	0 1491***
	[0 0034]	[0 0048]	[0 0057]	[0 0055]	[0 0034]	[0 0032]	[0 0037]	[0 0032]	[0 0031]	[0 0031]

Table 7. Overall Model 3 Regression Results
(continued, [after IPUMS, 2000–2012])

Interaction Terms										
Veteran Status/Years of Service										
vetstatyvetyrsmore	-0 3574***									
	[0 0053]									
vet01ltryvetyrsmore		-0 0313**								
		[0 0132]								
vet95x00yvetyrsmore			-0 0016							
			[0 0189]							
vet90x95yvetyrsmore				-0 0913***						
				[0 0187]						
vet80x90yvetyrsmore					-0 0383***					
					[0 0104]					
vet75x80yvetyrsmore						0 0063				
						[0 0136]				
vetvietnyvetyrsmore							-0 2150***			
							[0 0068]			
vet55x64yvetyrsmore								-0 1600***		
								[0 0146]		
vetkoreayvetyrsmore									-0 1862***	
									[0 0583]	
vetwwiiyvetyrsmore										-0 2878
										[0 3860]
Constant	6 1159***	6 0152***	6 2607***	6 2664***	6 1045***	6 1068***	6 1201***	6 1183***	6 1205***	6 1173***
	[0 0062]	[0 0078]	[0 0104]	[0 0104]	[0 0063]	[0 0062]	[0 0062]	[0 0063]	[0 0062]	[0 0062]
Observations	12,683,778	5,201,730	7,482,048	7,482,048	12,683,778	12,683,778	12,683,778	12,683,778	12,683,778	12,683,778
R-squared	0 32	0 323	0 315	0 315	0 319	0 319	0 319	0 319	0 319	0 319
AdjR2	0 32	0 323	0 315	0 315	0 319	0 319	0 319	0 319	0 319	0 319
Robust standard errors in brackets										
*** p<0 01, ** p<0 05, * p<0 1										

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Angrist, J. D. (1998). Estimating the labor market impact of voluntary military service using social security data on military applicants. *Econometrica*, *66*(2), 249–288. Retrieved from http://search.proquest.com/docview/203875355?accountid=12702

Borjas, G. J. (2010). *Labor Economics* (5th ed.). New York, NY: McGraw-Hill/Irwin.

Bureau of Labor Statistics. (n.d.). BLS information: Regional information offices. Retrieved from http://www.bls.gov/bls/regnhome.htm

Davila, A., & Mora, M. T. (2012). Terrorism and patriotism: On the earnings of U.S. veterans following September 11, 2001. *American Economic Review*, *102*(3), 261–266. doi:10.1257/aer.102.3.261

Hirsch, B. T., & Mehay, S. L. (2003). Evaluating the labor market performance of veterans using a matched comparison group design. *Journal of Human Resources*, *38*(3), 673–700. Retrieved from http://web.a.ebscohost.com.libproxy.nps.edu/ehost/detail/detail?sid=8f22d090-35b3-4b53-8eb0-2844d233556e%40sessionmgr4002&vid=0&hid=4212&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#db=bth&AN=10511743

Integrated Public Use Microdata Series: Version 5.0 (IPUMS). (2000–2012). Data on veterans observed from the 2000–2012 United States Census. [Database] (Database staff: S. Ruggles, J. T.Alexander, K.Genadek, R. Goeken, M. B. Schroeder, and M. Sobek) Minneapolis: University of Minnesota.

Loughran, D. S., Martorell, P., Miller, T., & Klerman, J. A. (2011). *The effect of military enlistment on earnings and education*. Santa Monica: RAND.

Martorell, P., Miller, T., Daugherty, L., & Borgschulte, M. (2013). *Effects of military service on earnings and education, revisited*. Santa Monica: RAND.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California